The Hong Kong Polytechnic University

Subject Description Form

Subject Code	LGT5104
Subject Title	Simulation for Operations Management
Credit Value	3
Level	5
Normal Duration	1-semester
Pre-requisite	MGT521/LGT5105 Managing Operations System MGT581/LGT5101 Statistics for Management **Either** MGT532 Deterministic Operations Research and MGT533 Stochastic Operations Research **or** MGT5321/LGT5102 Models for Decision Making
Role and Purposes	Simulation is one of the main techniques of Operations Management and is widely used in the analysis of practical problems, both in manufacturing and servicing industries. As such, it demands a complete subject to itself. It complements the Operations Research subjects and links in with many of the topics covered in Operations Management, e.g., queuing theory, inventory management, manpower planning, scheduling, machine maintenance, etc. As practical problems are usually very complicated, the use of simulation in practice seems to be inevitable. The subject will help students think more clearly about the nature of the problem phenomena and learn practical ways of investigating them together with the theory that underpins this practice.
Subject Learning Outcomes	Upon completion of the subject, students will be able to: (a) Understand the basic concepts of simulation. (b) Use a simulation software package to simulate and analyse a practical problem. (c) Analyse the results of a simulation and hence recommend appropriate solutions to the problem owner(s). Studying this subject will help develop students' critical and creative thinking, and arouse their interest in life-long learning to keep abreast of modern computer simulation technology.
Subject Synopsis/ Indicative Syllabus	**Introduction to Simulation** Rationale for simulation; deterministic and stochastic systems; continuous and discrete event simulation; importance of simulation in practice. **Basic Concepts of Simulation** Life Cycle Diagram; event scheduling and the process method; random number generation and sampling from distributions; model testing and validation; designing simulation experiments.

	Use of Simulation in Practice Practical examples of using simulation in practice. **Computer and Simulation** The use of computer in simulation; use of standard commercial software.
Teaching/Learning Methodology	Contact hours: 39 hours The lectures will present basic theoretical materials and their practical usage. Emphasis will be on the application of simulation in Operations Management areas. A wide range of examples will be used in the lectures to illustrate the usage of simulation in practice. Computer based simulation package(s) will be taught to supplement the theoretical materials, as simulation will usually involve the application of simulation packages. The main computer package to be used will be comparable to packages such as WITNESS and ProModel.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Coursework	100%	√	√	√			
Total	100 %						

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Lab coursework, midterm examination, and final project are designed to ensure all the learning outcomes are achieved.

To pass this subject, students are required to obtain Grade D or above in the Continuous Assessment.

Student Study Effort Expected

Class contact:	
▪ Lectures / Tutorials	39Hrs.
Other student study effort:	
▪ Homework	45Hrs.
▪ Project	42Hrs.
Total student study effort	126Hrs.

Reading List and References	Law, A.M. *Simulation Modelling and Analysis*, 4th edition, McGraw-Hill, 2007.
	Harrell, Ghosen and Bowden, Simulation using ProModel, 2nd Edition, McGraw-Hill, 2003.
	Paul, R.J. and Balmer, D., Simulation Modelling, Chartwell-Bratt, 1992.
	Pidd, M., Computer Simulation in Management Science, 3rd edition, Wiley, 1992.
	Journals
	Current issues of related journals.